

IN THE CLAIMS

Claims 1-14 (Canceled)

15. (New) A high frequency power amplifier module, comprising:

a high frequency power amplifier and a bias control circuit, each of which is monolithically formed on a single semiconductor chip which is mounted on a module and which includes a first input terminal, a second input terminal, a first output terminal, and a second output terminal,

wherein said high frequency power amplifier includes:

a first amplifying system coupled to the first input terminal and to the first output terminal, and including a plurality of first bias terminals, and a plurality of amplifying stages which are sequentially cascaded between said first input terminal and said first output terminal and each of which is coupled to a corresponding one of the plurality of first bias terminals so as to receive a bias potential therefrom, wherein each of said amplifying stages includes a MOSFET having a first conductivity type and a gate coupled to the corresponding first bias terminal, and

a second amplifying system coupled to the second input terminal and to the second output terminal, and including a plurality of second bias terminals, and a plurality of amplifying stages which are sequentially cascaded between said second input terminal and said second output terminal and each of which is coupled to a corresponding one of the plurality of second bias terminals so as to receive a bias potential therefrom, wherein each of said amplifying stages includes a MOSFET having the first conductivity type and a gate coupled to the corresponding second bias terminal,

wherein said bias control circuit includes a first MOSFET of the first conductivity type and a second MOSFET of a second conductivity type and is coupled to the plurality of first bias terminals and to the plurality of second bias terminals.

16. (New) A high frequency power amplifier module according to claim 15,

wherein said high frequency power amplifier module has a first control terminal and a second control terminal, each of which are coupled to said bias control circuit,

wherein said bias control circuit is arranged to receive a first control signal from said first control

terminal, and to provide a bias voltage in accordance with the first control signal to said first amplifying system, and wherein said bias control circuit is arranged to receive a second control signal from second control terminal, and to provide a bias voltage in accordance with the second control signal to said second amplifying system.

17. (New) A high frequency power amplifier module according to claim 16, wherein the second MOSFET of the second conductivity type is coupled with the first MOSFET of the first conductivity type in series, the second MOSFET is coupled with a third MOSFET of the second conductivity type in parallel with their respective gate terminals connected to each other, and the gate terminal and drain terminal of the third MOSFET are connected to each other.

18. (New) A high frequency power amplifier module according to claim 16, further comprising third and fourth amplifying systems mounted on the module and located at an outside of said semiconductor chip, said third and fourth amplifying systems being connected to the first output terminal and the second output terminal of said high frequency power amplifier, respectively.

19. (New) A high frequency power amplifier module according to claim 18, wherein said bias potential output of said bias control circuit is supplied to the third and the fourth amplifying systems.

20. (New) A high frequency power amplifier module according to claim 19, wherein the second MOSFET of the second conductivity type is coupled with the first MOSFET of the first conductivity type in series, the second MOSFET is coupled with a third MOSFET of the second conductivity type in parallel with their gate terminals connected to each other, and the gate terminal and drain terminal of the third MOSFET are connected to each other.

21. (New) A high frequency power amplifier module, comprising:

a high frequency power amplifier and a bias control circuit, each of which is monolithically formed on a single semiconductor chip which is mounted on a module and including an input terminal and an output terminal,

wherein said high frequency power amplifier includes:

a first amplifying system coupled to said input terminal and to said output terminal, and including a plurality of bias terminals, and a plurality of amplifying stages which are sequentially cascaded between said input terminal and said output terminal and each of which is coupled to a corresponding one of the plurality of bias terminals so as to receive a bias potential from the bias terminals, wherein each of said amplifying stages includes a MOSFET having a first conductivity type and a gate terminal coupled to the corresponding bias terminal, and

wherein said bias control circuit includes a first MOSFET of the first conductivity type and a second MOSFET of a second conductivity type and is coupled to the plurality of bias terminals.

22. (New) A high frequency power amplifier module according to claim 21, wherein said high frequency power amplifier module has a control terminal which is coupled to said bias control circuit,

wherein said bias control circuit is arranged to receive a control signal from said control terminal, and to provide a bias voltage in accordance with the control signal to said amplifying system.

23. (New) A high frequency power amplifier module according to claim 22, wherein the second MOSFET of the second conductivity type is coupled with the first MOSFET of the first conductivity type in series, the second MOSFET is coupled with a third MOSFET of the second conductivity type in parallel with their gate terminals connected to each other, and the gate terminal and drain terminal of the third MOSFET are connected to each other.

24. (New) A high frequency power amplifier module according to claim 21, further comprising a second amplifying system mounted on the module and located at an outside of said semiconductor chip, said second amplifying system being connected to the output terminal of said high frequency power amplifier.

25. (New) A high frequency power amplifier module according to claim 24, wherein said bias potential output of said bias control circuit is supplied to the second amplifying system.

26. (New) A high frequency power amplifier module according to claim 25, wherein the second MOSFET of the second conductivity type is coupled with the first MOSFET of the first conductivity type in series, the second MOSFET is coupled with a third MOSFET of the second conductivity type in parallel with their gate terminals connected to each other, and the gate terminal and drain terminal of the third MOSFET are connected to each other.

27. (New) A high frequency power amplifier integrated circuit device, formed on a single semiconductor chip, comprising:

    a first input terminal;  
    a first output terminal;  
    a plurality of first amplifying MOSFETs each of which has a first conductivity type and a gate terminal, and which are sequentially cascaded between said first input terminal and said first output terminal; and  
    a bias control circuit including a MOSFET of the first conductivity type and a MOSFET of a second conductivity type and coupled to the gate terminals of the plurality of first amplifying MOSFETs.

28. (New) A high frequency power amplifier integrated circuit device according to claim 27, further comprising:

a second input terminal;

a second output terminal; and

a plurality of second amplifying MOSFETs each of which has the first conductivity type and a gate terminal, and which are sequentially cascaded between said second input terminal and said second output terminal,

wherein the bias control circuit is further coupled to the gate terminals of the plurality of second amplifying MOSFETs.

29. (New) A high frequency power amplifier module according to claim 15, wherein each of said cascaded amplifying stages in said first amplifying system and said second amplifying system includes a control terminal and an output terminal, wherein said control terminals and said output terminals in each respective stage are alternatively provided in the same direction.

30. (New) A high frequency power amplifier module according to claim 15, wherein said cascaded amplifying stages of said first amplifying system include first and second

amplifying stages, each of said first and second amplifying stages including a control terminal and an output terminal, wherein the control terminal of said second amplifying stage of said first amplifying system and a wire connected to the output terminal of said second amplifying stage of said first amplifying system extend in directions crossing each other.

31. (New) A high frequency power amplifier module according to claim 30, wherein the wire that is connected to the control terminal of said second amplifying stage and the wire connected to the first terminal of said second amplifying stage extend in directions orthogonal to each other.

32. (New) A high frequency power amplifier module according to claim 29, wherein a bias resistance ratio of the first amplifying stage of each of said first and second amplifying systems or bias resistance ratios of the first amplifying stage and second amplifying stage of each of said first and second amplifying systems can be adjusted.

33. (New) A high frequency power amplifier module according to claim 32, wherein the bias resistance ratio of the first amplifying stage of each of said first and second

amplifying systems or the bias resistance ratios of the first amplifying stage and second amplifying stage of each of said first and second amplifying systems are adjusted by selecting connecting positions of electrical connectors that connect bias resistors formed on the surface of said semiconductor chip, the selection including a choice of no connection with the electrical connectors.

34. (New) A wireless communication apparatus comprising a high frequency power amplifier module according to claim 15.

35. (New) A high frequency power amplifier integrated circuit device according to claim 27, further comprising:

    a plurality of bonding pads formed on the single semiconductor chip;

    wherein the bias control circuit is coupled to said plurality of bonding pads, and includes a plurality of resistors, said bias control circuit being adapted to apply to one of said first amplifying MOSFETs, a bias potential value which is determined by a combination of resistors in the plurality of resistors, wherein the combination of resistors

is determined by an electrical connection between bonding pads in the plurality of bonding pads.

36. (New) A high frequency power amplifier integrated circuit device according to claim 35, wherein the bias resistance ratio of a first one of said first amplifying MOSFETs or the bias resistance ratios of said first one of said first amplifying MOSFETs and a second one of said first amplifying MOSFETs are adjusted by selecting connecting positions of electrical connectors that connect the plurality of bias resistors formed on the surface of said semiconductor chip, the choice including no connection with the electrical connectors.

37. (New) A wireless communication apparatus comprising a high frequency power amplifier integrated circuit device according to claim 27.